Notebook Series -- Notebooks by Edison
Notebook, N-13-10-31

This notebook was used by Edison during October-November 1913. The entries pertain to the composition of record blanks and to the molding and transfer processes involved in disc record manufacture. At the beginning of the book are notes, which appear to continue from N-13-08-05, involving experimental transfers made with various record blanks. Subsequent entries describe experiments on the composition of discs, particularly the grinding and fineness of the powder for blanks, and on the volatility of different varnish additives. A note by Edison indicates that the volatility experiments were continued by Louis (Ludwig) Ott. The entries for November describe experiments involving the composition of the powder and the Condensite varnish for record blanks, as well as experiments with variations in the pressure used to press blanks. Key ingredients being tested for the varnish include "para" (paraphenylenediamin), "penta" (pentachloraphenol), and "6/4" (hexamethylene tetramine). (Edison filed for a patent for "para" in 1914, which was issued in 1916.) At the end of the book are notes on a series of experiments with various screens, scrapers, and "tap" methods for adding the ground powder to the record blanks. Edison's notes indicate that employees Peter Christensen, Archie D. Hoffman, Sherwood T. (Sam) Moore, and Frederick P. Ott assisted him in some instances. A printed table of pressure and temperature values has been pasted onto the inside back cover. The front cover is labeled "Disc Record 1913." The pages are unnumbered. Approximately 120 pages have been used.

~~Nov 1~~ Oct 31 1913

Expts Coulson 3 to 1

715 Blank Req S-
all free OK 11 2nd 1

Print 9 OK 3 poor print

good 6
fair 6
12

RO 3
No Runout 3
faint 5
Big 1
12

Surface
fair

Run out
not good

Vernon 632 213 blank
plates baked 200 in oven

10 ok 1 cornel 1 Dia-

Prunt 6 ok

good	4	RO	8
fair	2	faint	2
bad	6	no RO	2
	12		12

Surface Bad

RO Bad

728 Blank 33 1/3 % Legible Good
66 2/3 [illegible]
5 % 6/4

Pres + Treasurer Reg & Calendar

2 Triumfan 2 Lens Clipped

good 3
fine 1

RO 2
faint 2

Surfaces
good -

Rem Oil
fair

Blank 3 to 1 - 5/- 6/4
2000 lbs pressure on blanket
1 Transfer press

Press, OK - 1

Good 1
Fine 1

Faint 1
Very faint 1

Better than Dark Print

Surface
good

Runs
fair to good.

This appears to show that it is best to use higher heat on transfer than on Prints, say 100 on Transfer and 75 on prints

Reg blanks + Van -
Transfd at 50 lbs
Printed 75 lbs -
Free 7
Stuck 5 -
Transfer 1 OK 11 Discards

Print 4 blanks - OK 4 -

good 2
fair 6

RO 4
faint 3
very " 1

Surfacing
Not good

Run out
Not good

Transfd 75 Print 50
7 free 5 stuck - OK 4 Cornel 2 Discds 6

Prints 6 OK -
very good 2
good 7
fair 3
12

RO 3
No RO 3
Very faint 1
faint 5

Surfacing -
fair to good

Run outs
fair to good

Oct 31 1913

Fred Oil - grind powder -
with phenol Resin + 5% 6/4 in

Disc made in small machine -

Unground Calliper 267/1000
Weight 19.9 -

ground in Chillicothe Mill - 249/1000
Weight, 20.2
ground 1 Hour

The surface on ground is
infinitely better, 3 times as
fine, The difference is very
surprising —

We ground + 1 hour more

The ground stuff gives a brighter
Color to disc —

We ground it 2 hours on medium discs — same lot being ground 1 hour longer

Its blacker + calipers 211/1000
Fred probably got more heat on it — its albo black coherent 1 hour was brownish —
Its surface is very shiny —
Weight 20 grams —

Think this blank would compare too much on our tracer schedule —
get too long a heat, believe Blank in making schedule get 500 to 600 pressures

+ that 2 contract 1 mm high at 1000 + 6 cool with 100 to 105 pressure + Venus with 6% Paula 2 para 220 deg bake wire cutter Prints Can be same schedule but 1000 to 1200 to fill with 75 to 80 lbs steam —

If original blank dont get good pressures + heat the veneer on transfer has to fill the holes of the bad surface & we increase scratch —

Unground disc represented same pressures as before 5 men on steam — Original Diameter 2.295 — after average 2.303 - increases 8/1000 top + bottom Edges when free
Thickness 267 - Represented 269 -

Disc 1 hour grinding - represented original thickness 249 now - 232

Original Dia 2.293 now 2.322

Disc 2 hour grinding - represented original thickness 211 - now 210
Original dia 2.293 now. 2.298
This was consolidated more than the others on 1st press by having more heat

Tried Duplicated Raw fibre + 2 hour grinding.

Raw. 1st press thickness 294 -
Dia 2.295 -

after repressing free edges
Thickness 268.5
Dia - 2 330

2 hour grinding 1st press thickness 231
Dia. 2.290
after repressing with free edges
Thickness 225
Dia - 2.297

Tried transferring on repressed Raw fibre with Tried off the 350 deg transfer Varnish, Top side didnt even indent the fibre in Veneer - Bottom side shows Indent of fibre but not plastic Enough to make a clinch —— These hard high temp baked Veneer are no good wants the Rag or softer - will do it tomorrow -

Alpha Naphtol MP 94 C BP 280 C

Oct 31 1913

Experiments to ascertain the Volatility of deferent substances we have used with good effect in the Varnish for disc

10 grams taken each case
Temperature kept at 350° F for One hour -

Acetanilid loss	MP 113 C.	49 %	
Alpha Naphtol "	MP 94 C	66.5	
Tetrachloronaphthalene (1mg crystal)		35.0	MP 182 C
Parachloroanilin nearly all gone in ½ hour			
Toluolsulphochloride Para.		43.6	
Paraphenylenediamine	MP 140	42.	BP 267

A large quantity of Paraphenylenediamine sublimes on the edge of the dish which was weighed as not being lost,

Parachlorganeline Can see it condense as a liquid on the Edge of the dish

Toluolsulfochloride, gives off gases boils 140 C. Reacts very acid to Litmus

Louis Otl is trying others.

Nov 1 1913

Small Disc Expt Continued

Put reg veneer on unground fibre disc — Phenomenon It clinched mechanically + could only be got off in 1/8 inch chips showing from half — the peculiar thing is that the chips of veneer came off clean of fibre, didn't tear the surface of blank off as with Reg blank The clinches pulled out without detaching any of the surface of the blank —

On the Big blank by warming slightly the whole of the veneer can be removed clean —

The veneer clinches more firmly than any we ever had & there will be no separation to give hollow sounds of RO —

The surface of the blank being unground is coarse

The fine ground will be better
thus reducing the general
surface -
The transfer heat was low
the top veneer didn't transfer
at all or, even give impression of
the fibres —
The Eggshell was very fine
ground.

The 2 hour grinding sticks
Even tighter can't get 1/32 chip
off — On heating veneer
pulls off clean, and infinitely
smoother than with unground
fibres, this moves a better
surface in fact the surface
should be nearly as good as a
double transfer, The top veneer
showed no signs of making an
impression of fibres, heat too
low, Should say 2 hour
grinding with 5% 6/4
+ Reg veneer should be nearly perfect

The One hour grinding is
Clinched very hard, can't
get it off even in 10,000 chips
has to be heated very hot to
get off & then its covered with specks
where it tore out the clinch —
probably had more heat, or was more plastic
The 2 hours had fewer knots &
came off hot easy — so is fair
preference —

Fine	1	No RO	1
Fair to good	2	Very faint	1
good	3	V Very faint "	1
	6		3
			6
Fair to good		fair to good	

Calliper 289 for 1
289.5" for 2

The 275 Fahr Oelly will not clinch on
2 hour grinding —

This shows we must not bake too high or higher than 225 — or we must reduce our 6/4 — down to where Reproduction dont cut —

719 Blank 5/- 6/4 — fine ground

Transfer Reg -
3 OK all

Print 3 all OK

Surface
face to grad

RO
face to grad

Hoffman Blanchi -

5% 6/4 4 to 1 ground in Reg
paint mixer 1000 lbs
pressure 4 min cream
100 lbs

- Too Coarse ground

What are they

738 Blanks 2 blanks 632 / of 1536

2 freesalesman Prints 2 OK

Thickness before transfer

342
327
333
320

4) 1322
330

330

Thickness after transfer

333
316
327
308

4) 1284
321

321

Thickness after personal

338
320
323
310

4) 1291
323

323

1 = faint to good
2 "
1 fine
2 "

NORO
faint RO
VVV faint
RO

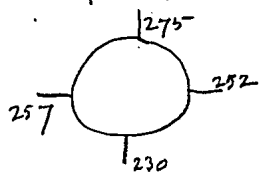
1 to 4 5°/₁ 6/4 —

Printed. 4th time —

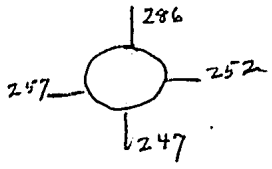
1 fair
2 good.

M19 Blank 5.06/4 — fine grained Plate

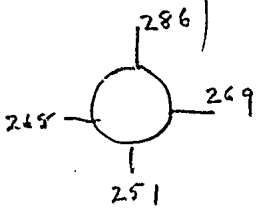
Before Inking



after



Printing



good — no Run out

719 — MP —

632 Yan 1536 — 1 free 1 Sluick —

5% 6/4 — Reg ground

1 ok 1 Cancel

before Transfg

237
249
233
242

4)961
240

240

after Transfering

233
241
231
235

4)940
235

235

after Printing

235
240
229
234

4)938
234

234 —

1 = fine
2 "

No RO
VVV faint

1 good
2 fine

VVV faint
no RO

Tried Abba No 6 Ball mill
1 hour 1½ 2 2½ + 3 hours
+ ungrained. The first hour
makes a big difference over
ungrained after that there
is very slight change
The 3 hour in small chillum
is a shade better than 3 hours
in No 6 Ball – The Balls are
1½" pebbles. There were 62
some 3 @ 3½ over ~~max~~ in
Couple days when I
think 2 hours will be
OK

Pulverizing
Not long 6 and –
1st time thru made rather fine
got 14% 2nd time 53% –

Let
20 grms
Closed screen

70% Ground
Pass 200 mesh
use this for test –

Screening Reg black powder 7/19

20 grams taken

Remaining on	60 mesh		0.5 grm
"	100	"	2.5 "
"	150	"	8.5 "
"	200	"	2.5 "
Thru	200	"	3.5 "
			17.5

Must all go thru 150 – about 160 @ 180 would be OK
between 150 + on 200 is OK

Wood

20 grms

Remaining on	60 mesh	0.2
"	100	7.5
"	150	7.5
"	200	2.0
Thru	200	2.5
		19.7

Between thru 150 + on 200 is OK –

3½ hours of Reg powder ground in
Chilean Mill – 20 grams
6.2 grms on 200
13.8 thru 200 –

Think this is a
few Days.

26.6 Var
NO 32 Reg Var with
150 mlg Naphtol Blue MS
to Dye Veneer Black
Darker than Reg Veneer handy
see them =

NO 33 — 26.6 Var without
Penta or para
Put in 333 Para & 150 mlg
Naphtol Blue MS
Not much darker
than Regular Veneer

34 — 2616 Vancomycin
Para or Penta [illegible]
put in 666 Mdg Penta
& 150 Mdg Nagital Blues

Takes hours for this to
get rubbery | Coherence Reg
goes in few minutes

& Para alone 5% of the amount of Reg
without
Penta also goes rubbery
a short time after Regular

It seems to want Paraphosphate
to make the Vancomycin
precipitant

719 powder ground 2 hours
1000 lbs press

Not Baked
Transferred 4
Free 2
Stick 2

1 ok 3 pellets

1 good	no RO
2 fair to good	faint ~~RO~~
1 good	V V faint
2 good	no RO
1 good	no RO
2 good	no RO
Surface ~~[illegible]~~	Remarks
fair to good	fair to good

Prints - 1 filled off Edge
2 filled on music than not
all filled on Music

The smaller pressure Hoffman uses the more likely the print will fill at 300 it fills all the music. but at 1000 it doesn't fill up to within 1/4" of all the music

719 fine grained
Unbatched
only 300 lbs pressure

3 trs
1 Slick
3 OR 1 Total dis cond

1 good	no RO
2 "	RO -
1 fair to good	faint RO
2 good	V faint
1 good	no RO
2 "	"
1 good	

The Contemporary surface is hollow in most, there are 1 or 2 soft velvet

Surfaces
Fair to good

Run Outs
Fair

The heavier balls in the X06
Ball mill flake 719 powder
up considerable
Hoffman. Thinks by putting
the Ball mill powder
through his feeder
it will deflake it —

Originally these blanks were pressed by Kaffum at 300 lbs by [illegible] then Aut Lorek & pressed 1000 lbs

719 - fine grained

Not Baked -

4 made 3 OK 1 Discard

Printing 4 poor print

1 good	no RO
2 "	no RO
1 good	no RO
2 V good	no RO
1 fair to good	no RO
2 good	no RO
1 fair to good	No RO
2 "	V V faint

defective print

719 fine ground Not Baked
prepared by Hoffman 1000
lbs 4 hot 100 lbs steam Cool
6 to 8 mm

3 free
1 shrunk

OR 4

Printing — 3. lacks good fill
at Edges 1 poor print

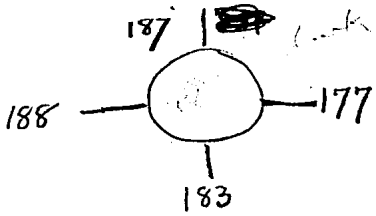
1 good 2 faint to good	V faint RO.
1 faint to good 2 good	No RO No RO
1 faint to good 2 good	RO VVV faint
1 faint to good 2 good	No RO No RO

If we put transformer on this it will surely have a RO = where its more dense darker & smoother the surface will be less coherence rough it will be through the Velocity be louder ——

Not fine Enough

719 ground fine —
Baked 1/2 hour 200 deg

Calipers



11/1000 def
too much —

Tried Repeater on rough blank
Very loud & a RO

RO very bad coherence it passes over point that is more shining (1c) had greater pressure thus def in pressure & smoothness causes RO,

719- Blanks fine grand, 2 hours
larger balls

Baked ½ hour 200 F.

Transferred 5

5 OK

Print - 5 poor prints

3 = Poor print margin Music OK
one crack in margin of one but Comp.
~~[illegible]~~ 2 = Poor print on Music not filled

~~[illegible]~~

1 fine 2 fair to good	faint no RO
1 = good.- 2 "	no RO no RO
1 fair to good 2 good-	V V faint ~~[illegible]~~ No RO no RO
1 fine 2 good	V. faint RO

not enough gum

719 – fine ground –

Made at 1000 Lbs –
Baked 1/2 hour 200 Feeler
lot 341 335 335 gum

Transferred 800 Lbs
Reg 4 mm schedule

OK2 decomposed 0
Cornel 1 plate
didnt come down side arm

Print Reg schedule 1000 lb

Poor Prints around Edge
The plates on transfer that plate
didnt show its surface is
Even worse when printing

1 good	faint
2 "	faint
1 good	no RO
2 "	no RO
1 fair to good	
2 good	no RO

1 fair to good	faint
2 good	V faint
1 good.	no RO
2 fair to good	faint
1 fair to good	faint
2 fine	no RO
1 good	V. faint
2 "	no RO

Fair 2	ROut 1
Fair to Good 5	No RO 5
Good 6	faint 5
Fine 1	V faint 2
14	VV " 2

Not ground Enough

719 — fine ground

Transfer Rejected —

6 OK 1 Cracked Edge

~~Pi~~ Transfer made 7
stick 3
frose 5.

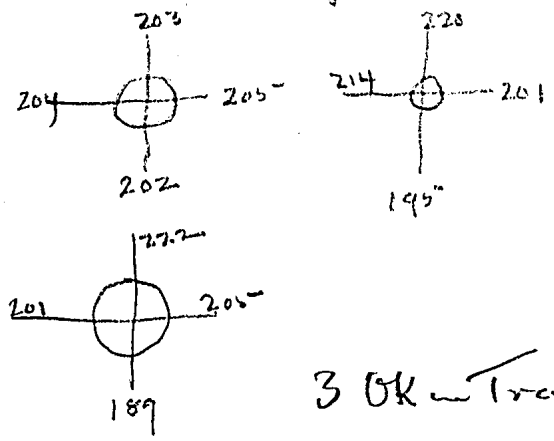
Pretty OK 2 Cracked 2

Poor prints 3. bad Edge not filled — no cracks 7

1 fair to good	VV faint
2 "	VV "
1 fair	faint
2 good	no RO
	RO
(1 fair	
2 good	no RO

719 Baked Transfer Ring
Schedule 800 lbs

Wt 367 367 365



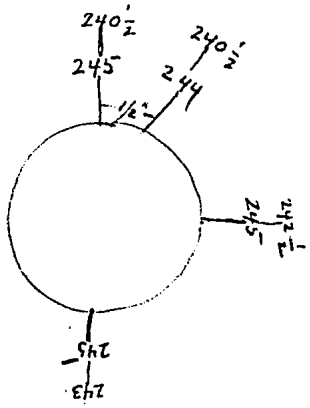
3 OK w/ Transfer

Print 3 all failed face on Edge

1 good.	faint
2 "	VVV faint
1 good.	RO.
2 "	NoRO
1 faint good	NoRO
2 good	V faint.

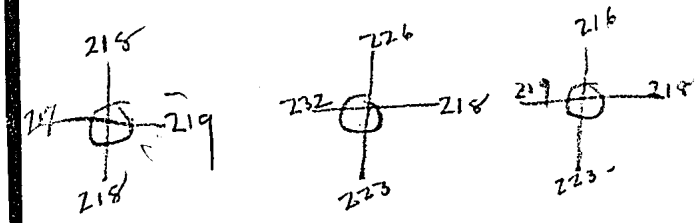
No 1 before printing average 218/1000
" 1 after 247

No 2 224.7
259



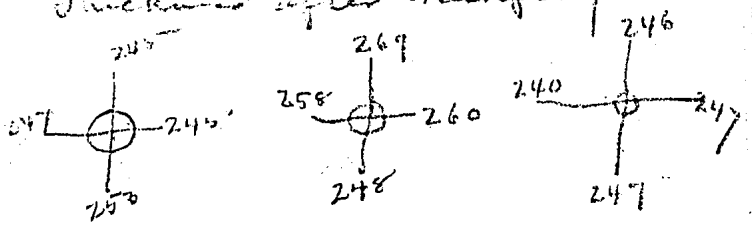
Baked few good
719 1000 lbs Req sch 800 Lbs on trays

lot 395 395 397



Transfered 3 10K 2 Comed
free release 3

Thickness after transfer

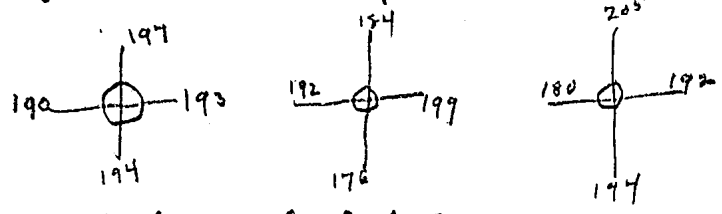


Present 3 — doubt full cut edges

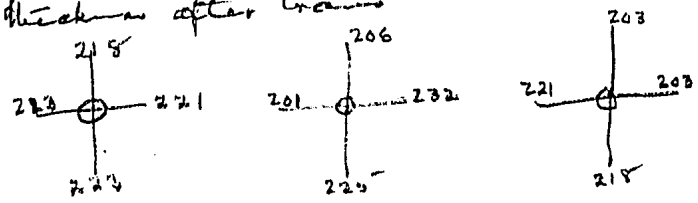
1 good	no RO
2 fine	no RO
1 good	VVVV fast
2 good	no RO
1 fair to good	"
2 good	"

719- Baked fine grain

Wf 344 342 347 Collapse of blank



Used this schedule -
2 min Cooled 1 on low 5 Heat 800 C
8 to Cool = Transferred 3 blanks
thickness after trans



Printed Reg Schedule -
| Poor print + Cracked at start of mix
| " " in Muffle
| " " "

Not tested = Poor last prints, schedule bad, + probably preset too low

grand fine

719 — Baked
wt 332 329 328

184 — 178	183 — 191	184 — 183
200 195	179 187	186 — 181

3 Blanks transfer

223 — 193	214 — 205	202 — 207
210 — 208	210 — 205	207 — 210

Oko 3 —

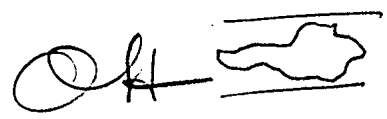
Printing — Req. wahidula 1200 lbs

2 Poor prints around edge
+ Cracked on feed lines —

1 Poor print —

There are no improvement,

Hoffman Brat in a 79
Blank 800 lbs
showed very smooth
bright spot –
He brake it at spot
& found piece of flint
175/1000 dia –



Thus kills Ball mill
using flints – only
iron lining & steel
Balls could be used
Hoffman has sample –

ground fine

719 Baked blanks

339 341 341 1000 lbs

193-186 182-205 194-186
178 207 177 208 188 195

7 Contact 2 low 7 high 8 Cont
1200 lbs pressure

3 Transform OK 3

Thickness after transforming
195-223 190-230 216-217
198 232 214 202 206 222

Primary Reg Sc
1 Poor print
2 " + Cracked in fold line

1200 lbs do Work
Hand 1000,

All good surface
NO RO

7/9 Baked Blanks
4 Blanks Req Schedule 1000 lbs
Using scraper to force more stuff
to Edges —

Wt 307 307 306 265 —

Transfd 4 Blanks Req Oak
free 4 O-Ro 4

Thickness after transfer —

201 — 203	203 - 208
198 206	197 203
201 - 201	180 - 188
211 190	180 175

Print Req Schedule 1 OK
3 poor print

dedrit fill —
LUCC Calliper Clean across

from ground

419 – Baked – Req sch lent only
500 Lbs –
360 grm –

Thickness 220 200 200 220
210 220 220 198

205 237
220 235

3 transfd well free – 1 Discard partial

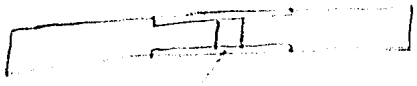
Drawing 3 poor print sheet
full at Edges –
Think 500 is better than 1000

Impression is that blanket
should be 300 Lbs transfer
500 & print 1000 –

719 — Double Transfer
800 lbs —
one side pull out,
other side big left
3" long 1" wide seal —
Not a success on this
Blank of one Expt is
a Criterion —

Promising

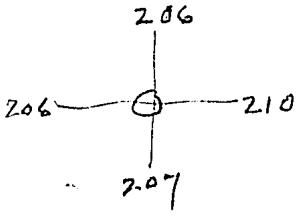
719 — 1000 lbs blank pressure



Dia before Transfer 9.985

.010 Recess

after 10.019



34/1000

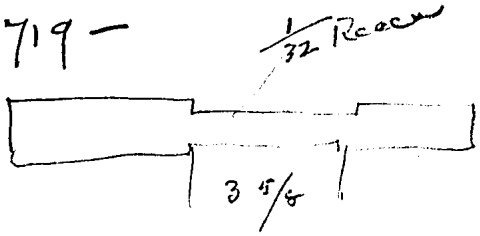
free release

1 OK

Printing - filled on Music
Cracked on margin didn't
quite fill — label not
quite filled but more
days at mould if label
was on mould —

10/1000 Recess helps to
flow & add pressure to Edge

719 —



Inscription [illegible] — 1 OR

Print, 1 poor short face

Cracks Label Space

Red & Cracked

Edges & Corners [illegible]

Too much recess

Note

as low as
4% would do for
second surfaces I think
if it will transfer —
not cut,

Regular Varnish
No Pava or Pentra

1% 6/4 - all night on glass 1" not condensed - part dried on plate rubbery but viscous it will not melt now, but soft + glutinous — brittle when cold thus too rubbery for Elements

2% all night on 1" glass, rubbery not very stiff = wrinkles forms film not viscous brittle cold this might be OK for 6 months — very brittle —

3% all night - rubbery in morning stiff this comes off as whole, but is very adherent although brittle cold — Not scratch by thumb nail cuts choppy —

4% Rubbery stiff - comes off as whole - stretching while warm - good gives curled shavings when cut. This should be OK for 6 months —

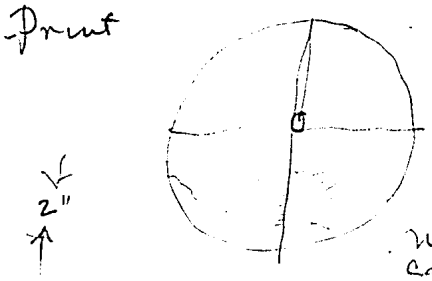
5% Rubbery Very stiff - comes off perfect as very adhesive film but found chip on cutting with knife —

5% 6/4 never used, so think best,

4% is lowest limit with glass Resin Phenol for Elements I think — but 1% shows nothing of the Resin —

719- Baked blank —

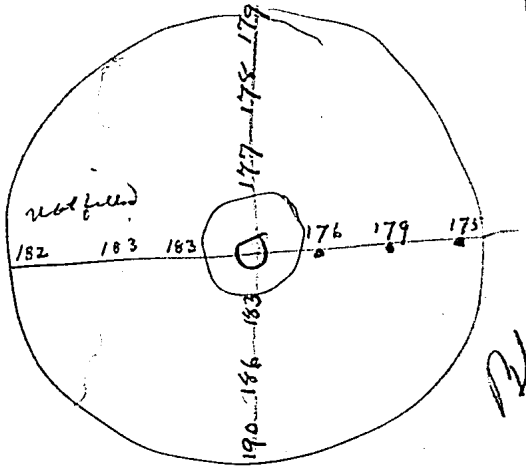
Print



2"

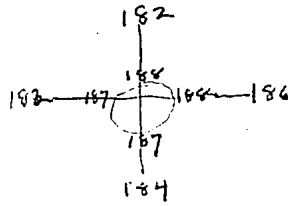
Not filled
Can see print impression
to within 1/2" of Edge

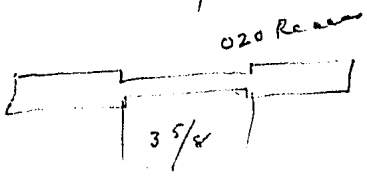
Dawson, Calliper don't take
anything as it springs back
flush but when pressing it
spongy + can't get Enough
pressure on to take impression



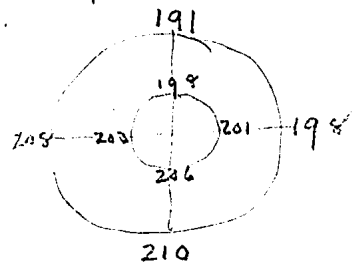
Blank up

719 Blank Baked 1000 Lbs pressure





after Transfer



Diameter before Transfer
9.985
after 10.043

Transfer Reg Oak 800 Lbs high
free release

Print Reg 50 OK on inside
Light print on margin nearly a
full except Same phenomenon

719 – Baked 1000 LBs
Transfers 500 lbs pressure on high

3 Transfers. 3 Cracked & poor surface –
No cracks except where no filler & at edge of it.
Place where blank not thick enough
~~[illegible]~~ If blank were even transfer good
Presents. Test yet nearly filled

1 fine	no RD
2 good	no RD
1 good	faint
2 "	no RD
1 good	faint
2 "	faint

Since 90cc or 13/1000 on a side will not fill a spongy blank by flowing it looks as if we must get the powder in the blank distributed more even

719 - Baked 1000 lb —
90 cc varnish -

Transfer Requirements —

1 ok fine.
2 didn't fill 1/4" marks ± 1 pi all around
3 like No 2 looks good, the bad blank

Prints. 1 Very bad not filled

No 2 filled one side perfect other side minus filled. 1/3 of margin not filled — No 3 Bad fill all around

90cc don't correct a bad blank - it don't flow in appearance if it does, the blank must be very bad & spongy at place

4 good
1 fine
1 Very fine

5 no RO
1 vvv faint

419- not edged not backed - 1100 lbs.

253
246 — 255
251

233
231 — 232
232

Thick before Transfer

272
273 — 275
276

251
255 — 249
253

Thickness after Transfer

Transferred at 500 lbs High —

Ring used in packing - Wt 407 417 grams
632 Van
2 oks-

Print - Reg soh - OK on mura faint creeks
on Marquia test OK —

Fair 2
Fair to g 1
good 1

RO 1
faint 2
No RO 1

Not baking is bad -

719 – 1000 lbs not baked
wt 425 – 416 – Ring used in
packing Thickness before transfer

242 – 241 237 – 228
239 – 248 241 – 226

after Reg sch

265 – 268 257 – 246
271 – 252 258 249

632 V – 10K 1 dr. not full – within 1" of edge free clearance

Printing Reg sch OK on music
faint cracks on feed line – 1

good 2 faint 1
no RO 1

This shows that with proper packing we shall be able to make full prints

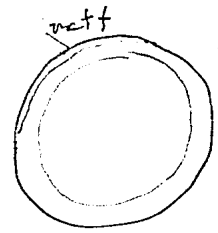
& of moulds are OK
Everything will be OK

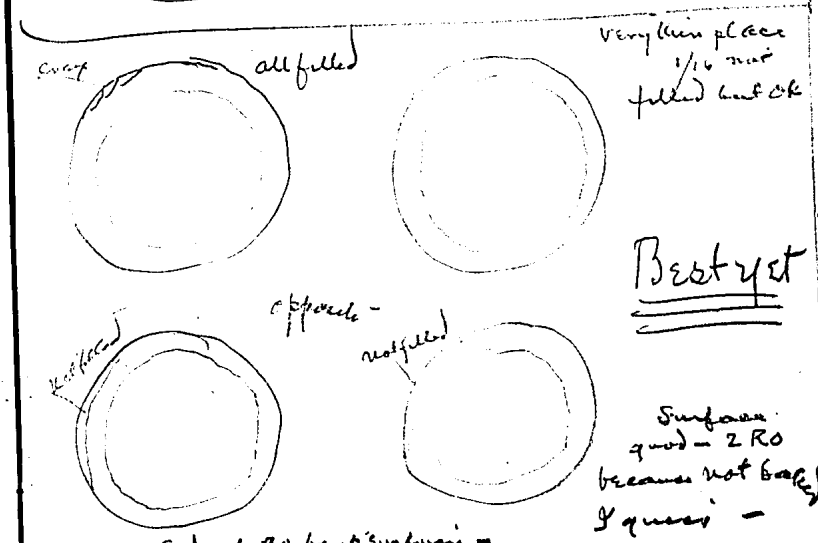
RO probably due to not baking the b/p mat sealing entirely & the veneer not sticking well on 1/2 condemned stuff —

7/19 — Not baked, Ring used in packing packed 2 sections — scraper used. 1000 lbs pressure used in press

Transferred 800 lbs — 632 V press release 30K

Print. 30K — Best yet.





719 - 1000 lbs Baked —

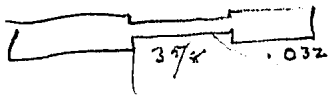
Transferred 7 min Cooled
19 min down
Cool -

OK 1 — 1 poor full around Edges
due to blank one poor full in spots

Print. Reg bch — 3 deduct
print around Edges -

Poor —

7.19 Baked - 1000 lbs
Transferred Reg Rack -



Diameter Before transferring 9.975
after 10.040

Oks 2 —

Painting Oks 2 - Label Red
a burned out - not
filled around Edge

7/9 - faked 1000 lbs
Transferred Req sch 800 lbs

Center depression at Load
.020
Dia before T 9975
after 10033
Prent
Dent full around edge

Load red & cracked out

The 5 samples of Phenol Resin Varnish with Pentaerythrite or Para with 1 2 3 4 & 5% 6/4 & Cried as recorded on previous page to the Varnish in the Camera Chamber of cold 115 Mlg Dethaen Paraphenol paper Then again on overall glass

Note No 1 Para addition Causes less Condensation & hardening

Note low hardening weak Tears

Corresponds to 2½% Para Note, stopped below No 5 after charging on hot plate 24 hours

1% - Not condensed except to a point where it & oil melt out to mahogany like condensed linseed oil. Its softer with Para than without the para causes less condensation, stays pretty like oil and tamp —
2% 1 Least

3% 24 hours - softer than 4 like still handkerchief - left on whole - no strength but tenacious getting off plate V. bitter cold

4% 24 hours & then right on plate puffed up in whole - More of Cox than 5% at low temp Cuts better but not strong as 5

5% 24 hours ½" above on glass when put on hot plate doesn't even puff up or give bubbles. Very flexible at low temperature

Think 500 lbs not enough to weld well acquainted 800 lbs to make good weld + prevent Run out

7/9 – Baked two Ring plug + scrapper
Req make back 500 lbs –
All ok w/ Transmitter free clearance

Printing 2 OK
1 Blank didn't fill 2" from Edge, small cracked –
one large defect in Wave

Crack but OK

Req sch
on print

Bad packing

Practically all filled
on Edges –

1 good	no RO
2 faint q.	RO on stand no RO in
1 faint	faint
2 good	faint
1 good	RO
2 faint –	no RO

Surfaces

Reg Blanks

Fine 7
Good 38
Load 40
Fair 55
140

32% fine & good

719 Blanks

Fine 11
Good 78
Fair 32
121

73% fine & good

Reg 32% good 73% Run Outs —
719 73% good 36% Run Outs —

Oh! !

35 Arf Experts with old powder
Overall — all Expts different
guns
272 Run Outs
96 No RO —

73% of all Run Out
including experts & all —

719

16 Expts —

31 Run Outs
55 No RO —

36% Run Outs

719 – Baked — 1000 lbs
Special packed 3 layers
turned top plate –
Wt 529 – 529 470

Transfd Req Sch 800 lbs
632 Var | 3 made acc from

Ok 2 – 1 2nd (bad fill)

Printed OR1

1 not good fill at Edges, where
no fill, it cracks at start of incoid
See radial streaks –
These dont look promising

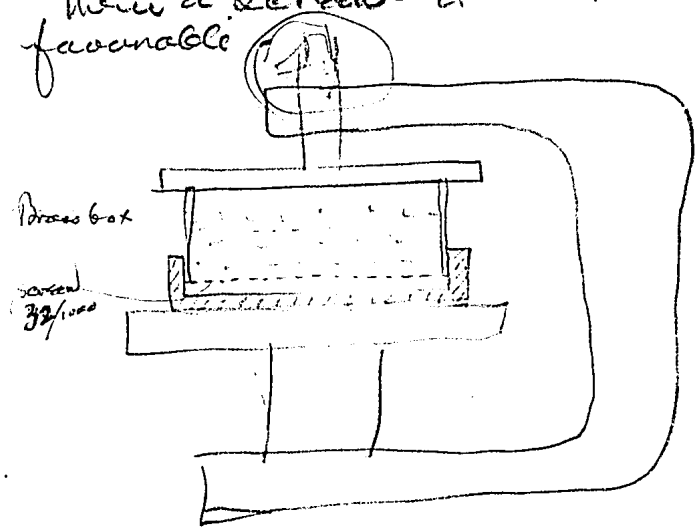
good 5
fair 1 – bad mould

No RO 1
faint 1
RO 2

To thick – think it squirts
at Edges & cracks Var –

Think thinner blank leaves
squeeze at Edges + leaves
allowed bad packing of blank

Just tried experiment filling blank moulds with powder thru a screen - it looks very favorable



Used the reg press let the screen box down in bottom of blank mould. Then raised it up 1/16 th + tapped the drum, then another 1/16 + tapped after a several fillings - Let it down hard + then lifted it out, found it ok except around edges - The drum or ladder being so wide didnt let powder

Come thru around edges -

The mesh is too fine as it takes considerable tapping on screen cylinder with press'd wood to pass enough lime - should be 2 or 3 times the area of screen that up to edge as close as possible

The screen is a little bulged

It's pushed very hard Hoffman is planning blank it would be OK I think except the edges which would almost certainly be bad

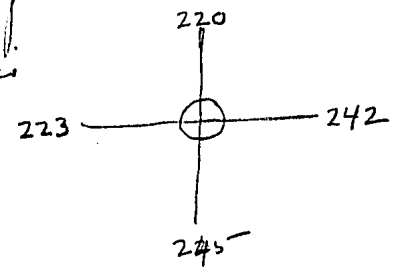
In practice the screen cylinder should be given a short twist between 2 studs a pin being connected to cylinder then the tapping would be effective after fast, especially with a coarser screen

Think about 80/1000 square be OK

powder will hold on 1/8"
screw when not tapped

Hoffman Blank weighs
382.5 gram

Callipers



We mark it No 1 screw -
It looks very good —

Didnt fill lead in
1/2 circumference

No 2 Screened blank

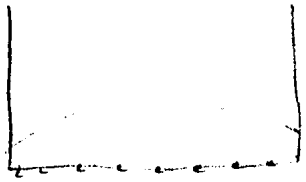
put bottom screen up from Gallon 7/16-
& Tapped till filled, it was very loose, the edge is fair now but in some places low as the drum is buckled
The screen had also been fixed by perforating the border which ran over on the screen reducing area of edge in opts —

I find the powder all full of flakes from the Buckwheat — We now screen it thru a smaller mesh than on the screen box so flakes will not accumulate & clog the box screen — There is absolutely Essential

There is one part that was clogged — Can't say

how long — This may
show up music

We found the powder in
the box also packed very
hard & then



probably because we (appear)
order — In practice the
whole box should represent
then a sound area —
Even then this will occur as
other parts get most movement
& shock —

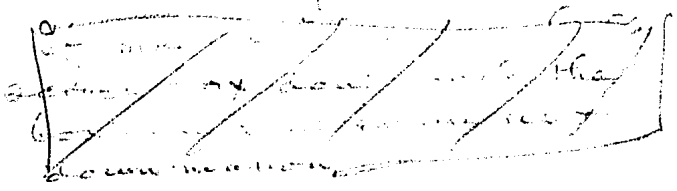
There is no need to bring box
down hard after full as the
powder is packed sufficiently
compact. This is a great

No 2 Adjustment Edge

Comes down from 437.5/1000 to 185

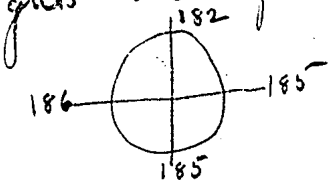
Surprise, - Evidently air has been the cause of our trouble in present system —

We will also have less air to come out or be forced in the blank by this method —



Possibly we shall have to prevent packing by adding coarser screens above the bottom screen 1/2" apart 3 or 4 inches up —

No 2 after preliminary weights 255 grains



Adjustment Edge

Nov 7 1913

It is possible that to get good blank surface we must sift a layer of 200 mesh before screen loading & after — say 1/32 thick

This will give fine surface for V Ears to weld to —

If surface bad & doesn't weld to cavities in blank hence the natural expansion of Condensate raises a lump or if forced in hole too much it leaves a cavity on surface which gives bad surface & cannot be seen by

Ulcers [redacted] —

probably 3 to 1 powder all thru 200 mesh but for preliminary & final surfaces

Nov 7 1913

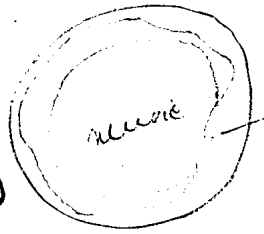
No 1 & 2 Transferred OK look good —

No 1 — 719 — Transfer Req with 800 lbs — free release

Printed Req Sch — Thick Blank

Didn't fill

1 = good — faint RO at bottom no RO in
2 "

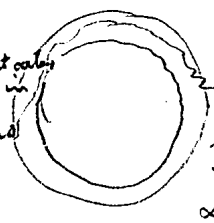


Not evenly loaded

No 2 Transfer same as No 1 free release — in making blank Moulds located & was doubtful get 1000 lbs

Print Req Sch — Thin Blank

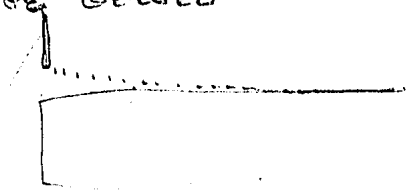
1 = fair to good — faint outer RO — no RO in
2 " " RO — more no RO —



Not evenly loaded

Note — outer Edge thin, & not thick outer thin at Edge where Lake Ring Loading —

As the case only of material on outer Edge think screen should be bevered

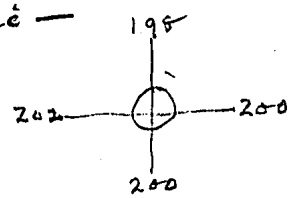


to correct this thickness of Edge

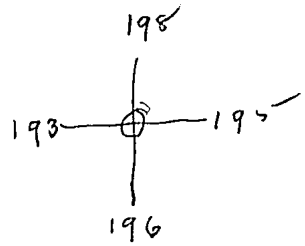
or perhaps the bottom or top plates should be convex make a blank thus

Then on transfer come flat.

No 3 Blank screen loaded all at once — wt 350 grms



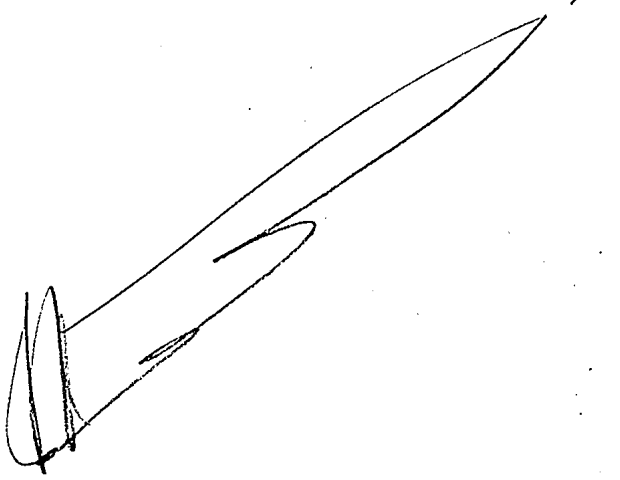
No 4



350 grms

The Harrow was a failure
it tears it + bumps go up
+ hit top of barrel or
thrown over top of ring
its the worst yet

We moved it to see
if Harrow ridges show



Note!

Rotating mould + opening
in sections dont fill span
but changes brought a pole
also making heavy blank
100 grams more

No 5 weighs 444 grams
Moved later, then capped
many times —

This is all filled
Music + 1/8 beyond —
This is progress —

S

1

Not quite filled in
Nurse Harrow
Show clean —
Not very promising

A06 — Wt 305

Harrowed mould – Harrow
put in natural & powder
put in in reaction.
1. There is excess of powder
which dropped off when
harrow lifted out this
I learned with a wrapper
it would have been 1/16
higher than on Canon

B

A

On pressing these 2 showed
up where Harrow pin
thinks dropped called
had there been no A + B
this would have been an
surprisingly good casting
blank

Baked

No 7 3 to 1 719 —
Looked like Cracked blank

Pressed dont seem even
to very thick —
Weight 507 grams —

Print — not filled
music not filled
Not promising

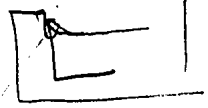
No 8 Print, Too thick
Didnt fill on Edges
2 spots where
music didnt
fill

No 8 — 3½ to 1
Seems to be quite Even
washing spots to
too thick —
Wt 529 grams —

No 9 =

New screen box – 1/16 mesh (5/1)

Rotated mould while tapping
its probably loaded too
heavy – reamed



Wt 293

Thicker at Edges –

When put on piston, it
blew 3, or 4 grains right out
of hole showing necessity
of placing top screen
pellet closely by Nearly
Moore think rings touched
will make another
with more powder –

Screen packed one setting

719 –

350
329 } gram
314

187

188 — 185 —

185 —

Transfer Ok 600 lbs – free

Print Dedut fill at Edge
+ part of muscle

PHENOMINON

The marks of the screen plugs
shows all over the record

There is a big Cue

No 10 same as 9 but
more stuff —
Wt-377 Looks pretty
Even

Printed — Cracked
on Edge —

Not filled in
Mouth & Edge

A-011 — 719

Loaded Rep like thread plunger dies put on & then violently vibrated —

Lot 446 —

Looks very even

Primed — Not fulled in most spots — middle of mass not fulled — 1

It was roughly vibrated & poorly done

No. 12

Scream, Potato —

then rung to put more at edge

tried turn top plate clock

Print — filled just beyond mark

Then shown watch mark powder around edges approximately —

The 2 blisters
showing red -
+ one puffed up
puffed up 20/1000 ml
more dont show
on prints S S
2 1

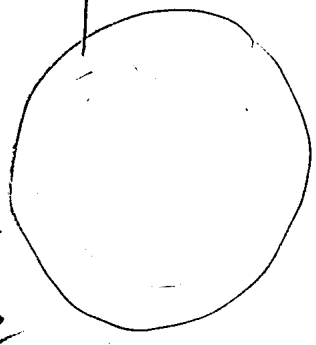
No 13 -
Serum one dump
~~[illegible]~~ rotated -
then press tap put on
of it rotated
Blank has one drop
Seal + it show modulation
like a few of the colonies
Vol. 355
Print - Dirty film
Mucus not rolled +
fine cracks at edge
of mucus
Not prominent

No 14 longer pins —
No matter how its put
on it evenly distributes it
but where pins pucked out
its higher on one side or
warts — its somewhat
irregular surface

Wt 343

Blank No —
Big shiny spot.

Print
filled very
good - nearly
whole of edge
but lots
small cracks
on edge



Shows shiny pl. on top
of narrows lines —
Not necessary

15 =

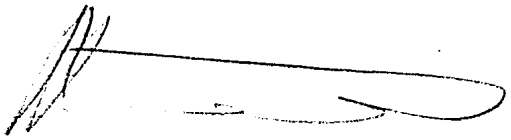
Moore placed powder in mould. with 2 scrapers -

Edison then hammered ring horizontally - for several minutes —

It was not level probably 1/32 to 1/16 out level -

Blank looked shiny all around Edge which is unlike all the others yet it was low at Edge when powder came in

Punt - Mica filled but part Edge not filled - 2 unfilled spots in Mica

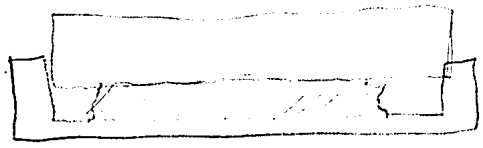


Note this —

Weight. 362
it was top worn with top ring
Calliper 255

No 16 W

Is a rough Expt —
Reg mould had a ring about 5/8 wall placed inside reg ring & then smaller ring & mold with powder — then the smaller ring pulled out



then top mould plate put on & pressed — Reg was the

Blank came out perfect shape but gray & least pressed except 6" center which was black & shiny

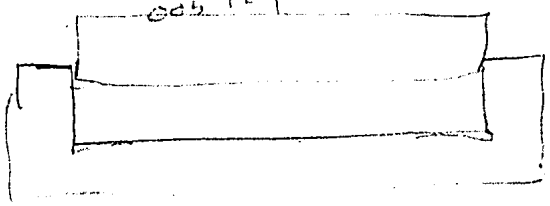
Wt

wont permit it

Scrapped they don't
account to library
good

No 17

Packed by screw
bottom & top .005" taper
.005" taper 1" beside blank



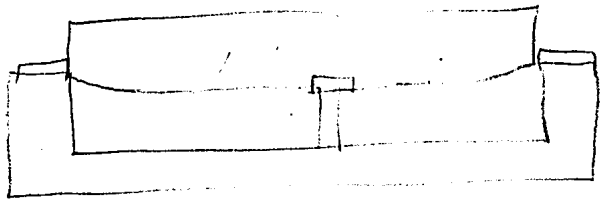
to get edges thicker .005"
is finished by hand small —
Wt of blank 360.
Calipers, 219 – 195 215
No – 12 cracks
Shiny spots +
grey places
Print – Not filled
Music filled

NO 18 – Blank
shows black shiny
all around Edges
but gray inside –
Think 1/4 inch is too
much – probably
3/16 or 5/32 will do it

Print Good

full, OK Cond.
but few Cracks at Extreme
Edge – too much stuff
at Edges – Cracks are
off where there is lack of
fill 1/16 at Edge

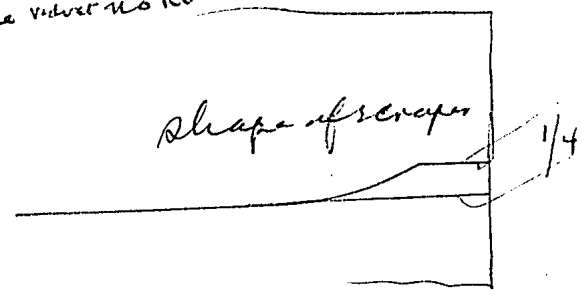
18 – First Blood



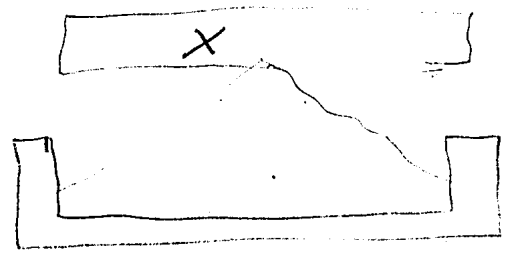
Scraper to put more air
Edges – Edison tapped
ring with hammer to
help Moore get last
print of calendar in
Wt 355
Calliper

203
200 — 191
192

Record
1 good VVV faint edge only
2 fine velvet no RO



19 –



Squeezed this down with sieve plate till X just entered mould ring – then put in press & brought up to contact heat for 3 min then 1000 lbs it was like the Ring Expt – only 6" of Cooler was Shiny – Edge Crumbly

MG Don't Blow Ewsu

Not,

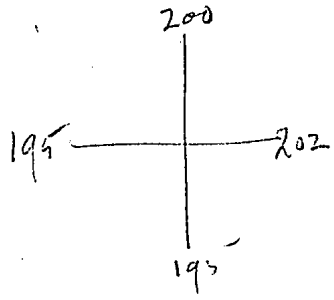
No 20 – poured in & scraped off – Put in press & brought up only to contact 3 min –
Took out & without any further pressure – it is very Even + tight grain all over –

We now bake it

Nat. filled. magic
practically filled

Pretty good consistency

21 Expanding Ring 1/16 metal
packed by pounding
[illegible]
3 Contact 5 1000 —



Looks fair .. rather even

Print very bad

not [illegible]

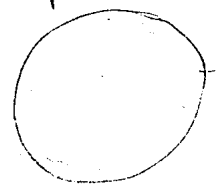
Printed Record test.

1 good vvv ~~[illegible]~~ faint.
2 good vvv faint ~~[illegible]~~ only

fine record.

22

Duplicate of 18



darkening off around edges showing that the 1/4 inch excess powder does the trick — Edison tapped it a few times twice while Mr Wilson was looking — 2 tappings — next more than 1/2 dozen times each

OK

1/8 at edge one side only 1/2 way round — ~~[illegible]~~ 1/3 on other side

Cancel

23

1/8 inch 719 powder in bottom, 1/8" 719 at top, in between is Red Cresol powder

24

Reg pkg with nakkw. 719

only one pkg — 3 contacts
5, at wap —

This will see what is min
contact will do

No good
Rollen

Record Test

1 fair to good
Loudest at Edge Less on middle
still less at Label — VVV faint

2 = good.

RO 1st part faint middle
no RO Center

and can hardly hear
surface —

25

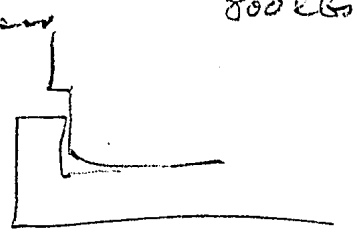
Dup of 14
(Mom Tape)

Shiny all around Edge
on one side, not very
noticeable on other
side —

OK filled all over
except 2" 1/16 wide at
one edge Comply OK —

26 – $\frac{1}{8}$ 15

Scraper 800 lbs Transfer



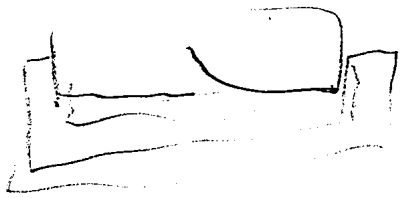
Didnt fill full
not as good as the 1/4"
as in No 18 –

1 good 4 edge RD outer edge none inside
2 " facent at center "

Deep – not quite filled
in one place runs to
surface

27.

Moose turned up



1 out fan belts from Lead good
RD work all Home

2 - Double run out
allway in engine fan
outer belt good all
Lubed

out true Expts not good
[illegible] on platten is
out —

Platten out .015

Duplicates of No 18 —

Shiny ½" to 1" all around edges of blank —

No 1

Mould 8	1 good		no RO
Mould 49	2 good		VVV faint

No 2

Mould 3	1 good		faint
out .005 " 4	good		No RO

No 3

out .030 Mould 15	1 good		faint
out .030 67	2 good		V'V faint

Dup of 18 Continued

No 4

post 015
out 030 Mould 8 1 good faint
" 49 2 " "

49 lines abreakable w mould.

out 10/1000

No 5

out 010 Mould 15 1 good Outer edge RO
out 015 " 67 2 fair no RO middle back VVV faint

67 w Mailer - lines always Record w co R -

No 6

out 1/32 Mould 3 1 good no RO
out 1/32 " 4 2 good VVV faint

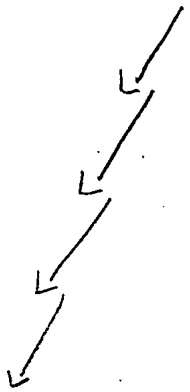
50 grms

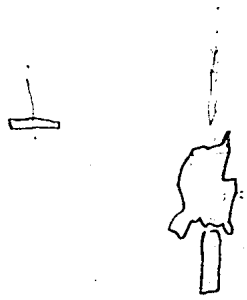
Thru 200

1st pass 18.9
2 " 2.1
3 " .4

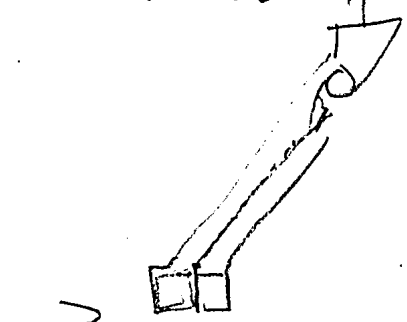
22.1

Thus no better than





Screen Expt



Slots .006 wide
Brass

50 grams of fine ground 719
which practically had 14.5 @
47% passing 200 mesh

1st Run	got	20.5 grms	-	12½ thru 200	
2	"	8.2	"	4.8	"
3	"	3.3	"	1.6	"
4		2.3	"	1.1	"
5		1.2	"	0.6	"
		35.5		20.6	

under Micro only 1 & 2 are good, but think 1st pass w/ best only is use - or 40%

Christmas tested 6
Records Dup of 18
719 powder heavy loading
at Edge new Imp method
& Revolving spreader
Brot up in ovens to 130 Fahr
1 hour —
then use CO_2 anhydride
41 deg Fahr below zero 2 hours 6.
While 41 deg below zero
in Center at hour mark
lower at Edges say 60 deg
None were cracked all
OK - surface & RO seemed
little harder —

Dup of 18 — 719 fine grained
47% Ibm 200 mesh —
6 Blanks —
Transfer Reg 7 Contact 3 low 7 high
800 lbs — 632 Var 1560 Lot
All free release
1 blank showed rad around Center — not
uncontrol — all OK in transferring
Printed = 5 ok — 1 bad blank didn't fill
in printing cracked at 1st line music where
not filled
all printed on 15 & 67

1	15	1 Land outer four middle good Label RO Edge - less center no RO Label
	67	2 - good all over vvvv faint
2	15	four to good in the middle none at Label RO Edge faint
	67	defect at Edge - good, Center good Label good vv faint RO —
3	15 - good	no RO
	67 fine	no RO
4	15 good -	faint
	67 good	V faint

5 15 - good VV faint

67 - good Bad RO on stand. Center Lab No RO

5 no Record that not filled a lead cracks at Edge Mis

15 - good VVV faint

67 good No RO

This process blanks OK to up to moulds now

Possibly more RO in short than long schedule

719 - new pkg Dup of 18

Transferred 2 Contral 1 Low

5 high 800 lbs -

3 transfers records short schedule

Print short sch as above

Tracked blank

Record 67 1 side faint to good RO

15 2 " good faint

Printed long schedule

Music,

1 faint to good, no RO

2 good - faint -

Print, 2 short schedule

Record 15 1 good faint RO faint no RO Mid-Line

" 67 2 fine - faint Edge No RO Mid-Line

67 Print 3rd short sch -

1 good - VVV faint

15 good faint

Short schedule —

15 1 - fair - Edge RO - Mid + End vvv f
67 2 fine vvvv faint,

11-12-13.

Dup of 18 719 rowler

Transfer on short schedule - 2 min
Contact 1 min Low 5 min high 800 kb
'6 Transfer 4 OK 2 hy small burds - free release

Prints 15 OK IIII Two cracked Edge this
has 3/16 width of seed edge, this is abnormal,
amount of seed & this has some relation to
Cracks our old enemy

1	15 faint to good 67 - good	no RO faint
	15 good 67 fine	no RO no RO
	15 good 67 fine	no RO no RO
	15 good 67 fine	no RO VVVV faint
	15 good 67 good	no RO VVVV faint
	15 good 67 fine	no RO no RO

RAM		
7½"	10"	12"
LBS. PRESSURE.		
500	300	200
600	350	250
700	400	300
800	450	325
900	500	350
1000	550	400
1100	625	425
1200	675	475
1300	725	525
1400	800	550
1500	850	600
1600	900	650
1700	950	675
1800	1025	700
2600	1450	1000
2700	1500	1050
2800	1575	1100
2900	1625	1125
3000	1675	1175
3100	1750	1200
3200	1800	1250
3300	1850	1300
3400	1900	1322

STEAM	
GAUGE PRESSURE LBS. PER. SQ. IN.	TEMPERATURE FAHRENHEIT.
30	273.87
40	286.54
45	292.2
50	297.46
55	302.42
60	307.10
65	311.54
70	318.77
75	319.80
80	323.60
85	327.36
90	330.92
95	334.35
100	337.66
105	340.8
110	344.
115	347.
120	349.8
125	352.6
130	355.3